YKTLRAEQASQEVKNWMTET

QUERY	YKTLRAEQASQEVKNWMTET
CONSENSUS_A	F--------t----g-----
A.KE.Q23-CXC-CG	F--F-----T-D------D-
A.SE.SE6594	F-V------T----G-----
A.SE.SE7253	F--------T-D--------
A.SE.SE7535	F----------D--------
A.SE.SE8131	F-A------T----G---D-
A.SE.SE8538	F-A------T----G-----
A.SE.SE8891	F--------T----G-----
A.UG.92UG037	F--------T----G-----
A.UG.U455	F--------T-D--------
CONSENSUS_B	--------------------
B.AU.AF128998	----------D--------
B.-.NL43E9	--------------------
B.AU.MBC18	---------T----------
B.AU.MBC200	--------------------
B.AU.MBC925	----------D--------
B.AU.MBCC54	--------------------
B.AU.MBCC98	--------------------
B.AU.MBCD36	--------------------
B.CN.RL42	----------D--------
B.DE.D31	---------T----------
B.DE.HAN	---------T----------
B.ES.89SP061	--------------------
B.FR.HXB2	--------------------
B.GA.OYI	----------D--------
B.GB.CAM1	--------------------
B.GB.MANC	--------------------
B.JP.JH31	--------------------
B.NL.3202A21	--------------------
B.TW.LM49	-----T-----D--------
B.US.85WCIPR54	--------------------
B.US.AD8	--------------------
B.US.BC	--------------------
B.US.DH123	--------------------
B.US.JRCSF	---------T----------
B.US.JRFL	--------------------
B.US.MNCG	---------------RT---
B.US.NC7	--------------------
B.US.NY5CG	--------------------
B.US.P896	--------------------
B.US.RF	----------D--------
B.US.SF2	----------D--------
B.US.WC001	--------------------
B.US.WEAU160	---------T----------
B.US.WR27	--------------------
B.US.YU2	--------------------
CONSENSUS_C	F--------t-d------d-
C.BR.92BR025	F--------T-D------D-
C.BW.96BW01B22	F--------T-D------D-
C.BW.96BW0402	F-------ST--------D-
C.BW.96BW0502	F--------T-D--------
C.BW.96BW1104	F-------S---------D-
C.BW.96BW1210	F--------T-D------D-
C.BW.96BW15B03	F--------T-D------D-
C.BW.96BW1626	F--------T-D------D-
C.BW.96BW17A09	F--------T-D------D-
C.ET.ETH2220	F--------T-D------D-
C.IN.93IN904	F--------T-D------D-
C.IN.93IN905	F--------T-D------D-
C.IN.93IN999	FR-------T-D------D-
C.IN.94IN11246	F--------T-D------D-
C.IN.95IN21068	F--------T-D--------
CONSENSUS_D	-----------d--------
D.CD.84ZR085	--------------------
D.CD.ELI	-----------D--------
D.CD.NDK	----------D---------
D.CD.Z2Z6	--------------G-----
D.UG.94UG1141	-----------D--------
CONSENSUS_F	F--------T----G---D-
F.BR.BZ162	F--------T----G---D-
F.CD.VI174	F--------T----G---D-
F.RW.VI69	F------E-T----G---D-
CONSENSUS_F1	F--------?----g---d-
F1.BE.VI850	F-V--------D--G---D-
F1.BR.93BR020.1	F--------T----G---D-
F1.FI.FIN9363	F-A------T----G---D-
F1.FR.MP411	F-------------------S
CONSENSUS_F2	F--------T----?-----
F2.CM.MP255	F--------T----------
F2.CM.MP257	F--------T----G-----
CONSENSUS_G	F--------T----G---D-
G.BE.DRCBL	F--------T----S---D-
G.FI.HH8793	F--------T----G---D-
G.NG.92NG083	F--------T----G---D-
G.SE.SE6165	F-C--------D--G---D-
CONSENSUS_H	F--------T-D------D-
H.BE.VI991	FRV------T-D------D-
H.BE.VI997	F--------T--------D-
H.CF.90CF056	F--------T-D--------
CONSENSUS_J	F-A------T-D------D-
J.SE.SE9173	F-A------T-D------D-
J.SE.SE9280	F-A------T-D------D-
CONSENSUS_K	f--------T--------?-
K.BE.VI325	F--------T--------D-
K.CD.EQTB11C	FRV------T----------
K.CM.MP535	F--------T--------D-
N.CM.YBF30	---------T----------
CONSENSUS_O	---------T----------
O.CM.ANT70C	---------T----------
O.CM.MVP5180	---------T----------
CRF01-AE.CF.90CF40	F--------T----------
CRF01-AE.TH.93TH25	--V------T----------
CRF01-AE.TH.CM240	---------T----------
CRF01-AE.TH.TH022	---------T----------
CRF01-AE.TH.TH047	---------T----------
CRF02_AG.FR.DJ263	F--------T-----R----
CRF02_AG.FR.DJ264	F--------T----------
CRF02_AG.NG.IBNG	F--------T----------
CRF03_AB.RU.KAL15	F--------T-D--------
CRF04_cpx.CY.94CY0	F-C------T----------
CRF04_cpx.GR.97PVC	F-C------T----------
CRF04_cpx.GR.97PVM	F-C------T-D--------
AC.ET.E3099G	F-A------T-D--------
AC.IN.21301	F--------T-D------D-
AC.RW.92RW009	F----------D------D-
AC.SE.SE9488	F--------T-D------D-
AC.ZM.ZAM174-21	F--------T--------D-
AC.ZM.ZAM184	F--------T--------D-
AC.ZM.ZAM716-17	F--------T-D------D-
ACD.SE.SE8603	F--------T----------
AD.SE.SE6954	----------RD--------
AD.SE.SE7108	F--------T----G---D-
ADHU.NO.NOGIL3	F--------T--------D-
ADU.CD.MAL	F--------T----------
AG.NG.G3	F--------T--------D-
AG.SE.SE7812	F--------T-D--------
AGHU.GA.VI354	F--------T----------
AGJ.AU.BFP90	F--------T--------D-
AGJ.ML.95ML8	F--------T--------D-
AGU.CD.Z321	F--------T----G---D-
BF.BR.93BR029.4	--------T--D--------
DF.CD.VI961	----------D--------
U.CD.VI1126	F--------T--------D-
CONSENSUS_CPZ	--------------?-----
CPZ.CD.CPZANT	---I-------P--A-----
CPZ.GA.CPZGAB	------------------D-
CPZ.US.CPZUS	----------P---T-----

Study Subject ID:01RCH85
Study Subject Clone:
Study Subject HLA:A33,A19,B44,B58,Cw7,Cw16
Sequence: Known reactive 20Mer0: YKTLRAEQASQEVKNWMTET p24(169–188)

Possible HLA

A19	A*7403
A33	A*3301,A*3303
B44	B*4402,B*4403,B*4404,B*4405,B*4406,B*4407,B*4408
B58	B*5801,B*5802
Cw7	Cw*0701,Cw*0702,Cw*0704,Cw*0706

Possible Epitopes based on anchor residues

(8-16)	QASQEVKNW	B*5801
(9-16)	ASQEVKNW	B*5801

Anchor Residues Searched

B44	X[E]XXXXXX[Y]
B44	X[E]XXXXX[Y]
B44	X[E]XXXXXXX[Y]
B*4402	X[E]XXXXXX[FY]
B*4402	X[E]XXXXX[FY]
B*4402	X[E]XXXXXXX[FY]
B*4403	X[E]XXXXXX[YF]
B*4403	X[E]XXXXX[YF]
B*4403	X[E]XXXXXXX[YF]
B*5801	X[AST]XXXXXX[FW]
B*5801	X[AST]XXXXX[FW]
B*5801	X[AST]XXXXXXX[FW]
Cw*0702	XXXXXXXX[YFL]
Cw*0702	XXXXXXX[YFL]
Cw*0702	XXXXXXXXX[YFL]

This table lists epitopes that are experimentally observed to be presented by a HLA type carried by the patient, but the de£ned epitope has substitutions relative to the peptides from your reference strains and so might be missed by your reagents: in HXB2 for Gag, Pol; MN for Env; BRU for Nef, relative to most B clade Sequences in the database:

Protein	Epitope in Database	Epitope in Ref. strain	Epitope in Consensus B	HLA	Notes
p24(15–23)	LSPRTLNAW	ISPRTLNAW	ISPRTLNAW	B57,B58	
p24(108–117)	TSTLQEQIGWF	TSTLQEQIGWM	TSTLQEQIGWM	B*57,B*5801	
p24(108–117)	TSTVEEQQIW	TSTLQEQIGW	TSTLQEQIGW	B*5801	
p24(108–117)	TSTVEEQQIW	TSTLQEQIGW	TSTLQEQIGW	B58	
p24(174–184)	AEQASQDVKNW	AEQASQEVKNW	AEQASQEVKNW	B*4402	
p24(174–184)	AEQASQDVKNW	AEQASQEVKNW	AEQASQEVKNW	B*4402,B44	
Protease(3–11)	ITLWQRPLV	VTLWQRPLV	ITLWQRPLV	A*6802,A*7401,A19	
gp160(31–40)	AENLWVTVYY	TEKLWVTVYY	AEQLWVTVYY	B*4402	
gp160(31–40)	AENLWVTVYY	TEKLWVTVYY	AEQLWVTVYY	B44	

Table 1: **p24**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
p24(15–23)	p24()	LSPRTLNAW	HIV-1 exposed seronegative	human(B57,B58)	[Kaul (2000)]
	• 11/16 heavily HIV exposed but persistently seronegative sex-workers in Nairobi had HIV-speci£c CD8 gamma-IFN responses in the cervix – systemic CD8+ T cell responses tended to be to the same epitopes but at generally lower levels than cervical CD8+ T cell responses • Low risk individuals did not have such CD8+ cells • CD8+ epitopes T cell DTVLEDINL (3 individuals), SLYNVATL (4 individuals), LSPRTLNAW (3 individuals) and YPLTFGWCF (4 individuals) were most commonly recognized by the HIV-resistant women				
p24(108–117)	p24(240–249 LAI)	TSTLQEQIGWF	HIV-1 infection	human(B*57,B*5801)	[Goulder (1996)]
	• Response to this epitope was found in 4 slow progressing HLA-B*57 individuals, in 2 it was dominant or very strong • For one donor (from Zimbabwe) this was de£ned as the optimal peptide • This epitope can be presented in the context of the closely related HLA molecules B*5801 and B*57				
p24(108–117)	p24(241–250 LAI)	TSTVEEQQIW	HIV-2 infection	human(B*5801)	[Brander & Goulder(2001)]
	• C. Brander notes this is a B*5801 epitope				
p24(108–117)	p24(241–250)	TSTVEEQQIW	HIV-2 infection	human(B58)	[Bertoletti(1998)]
	• HIV-2 epitope de£ned from an infection in Gambia, Bertoletti, Pers. Comm. • All HIV-2 sequences from the database are TSTVEEQIQW in this region, not TSTVEEQQW as in the paper				
p24(174–184)	p24(306–316 LAI)	AEQASQDVKNW		human(B*4402)	[Brander & Goulder(2001)]
	• C. Brander notes this is a B*4402 epitope				
p24(174–184)	p24(306–316 LAI)	AEQASQDVKNW		human(B*4402,B44)	[Brander & Walker(1997)]
	• Pers. Comm. from D. Lewinsohn to C. Brander and B. Walker, C Brander *et al*., this database, 1999				

Table 2: **Protease**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Protease(3–11)	Protease(71–79 LAI)	ITLWQRPLV		human(A*6802,A*7401,A10)	[Ong (1998)]
	• Predicted on binding motif, no truncations analyzed • Clade A/B/D consensus, S. Rowland-Jones, pers. comm.				

Table 3: **gp160**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
gp160(31–40)	gp160(30–39 WEAU)	AENLWVTVYY	HIV-1 infection	human(B*4402)	[Brander & Goulder(2001)]
	• C. Brander notes this is a B*4402 epitope				
gp160(31–40)	gp160(30–39 WEAU)	AENLWVTVYY	HIV-1 infection	human(B44)	[Borrow (1997), Goulder (1997), Borrow & Shaw(1998)]
	• Two CTL lines from the patient WEAU were studied – one had an optimal peptide of (A)AENLWVTVYY, and the other (A)AENLWVTVY, and both responded equally well with one or two N-term Alanines • Rapidly post-infection, a strong immunodominant response was observed against this epitope • The naturally occurring forms of the peptide found in WEAU were tested as targets for early WEAU CTLs – the form TENLWVTVY was as reactive as the wild type AENLWVTVY – but the forms AKNLWVTVY, AGNLWVTVY, AANLWVTVY did not serve as targets • The glutamic acid in the second position is a B44 anchor residue • [Goulder (1997)] and [Borrow & Shaw(1998)] are reviews of immune escape that summarizes this study in the context of CTL escape to £xation			

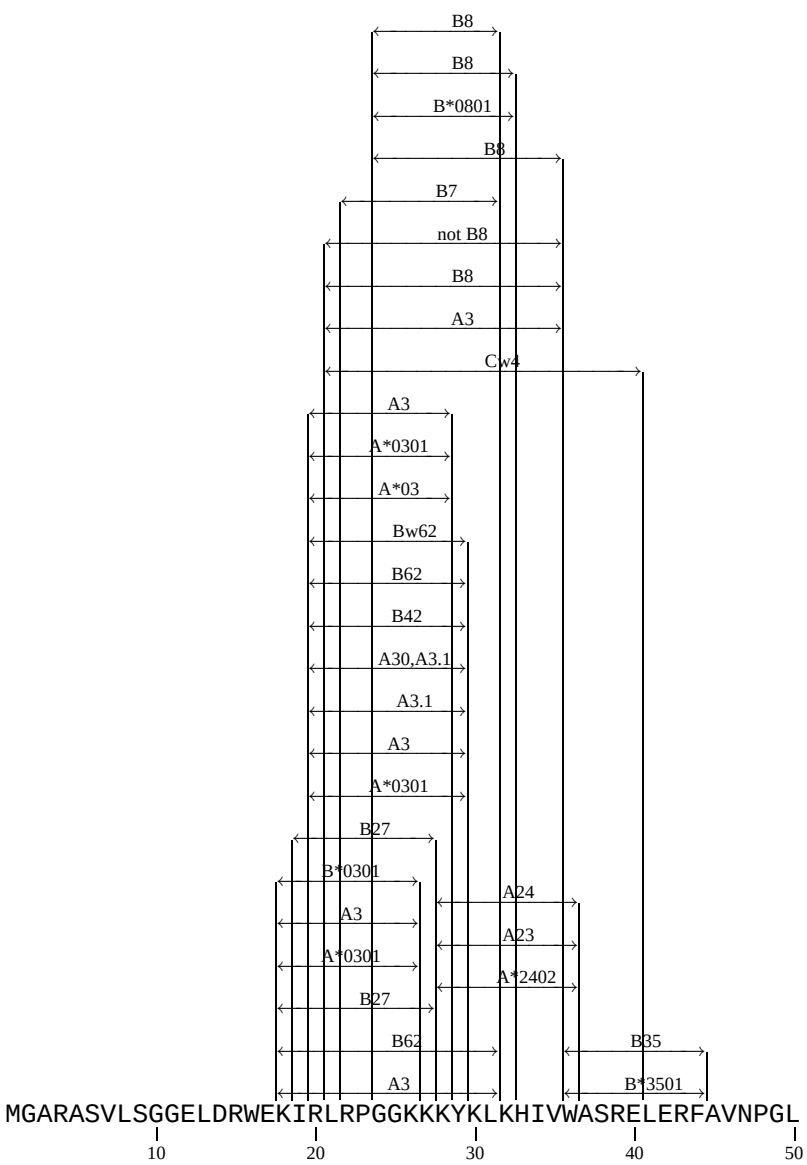
Table 4: **All De£ned Epitopes within the 20mer, regardless of HLA type**

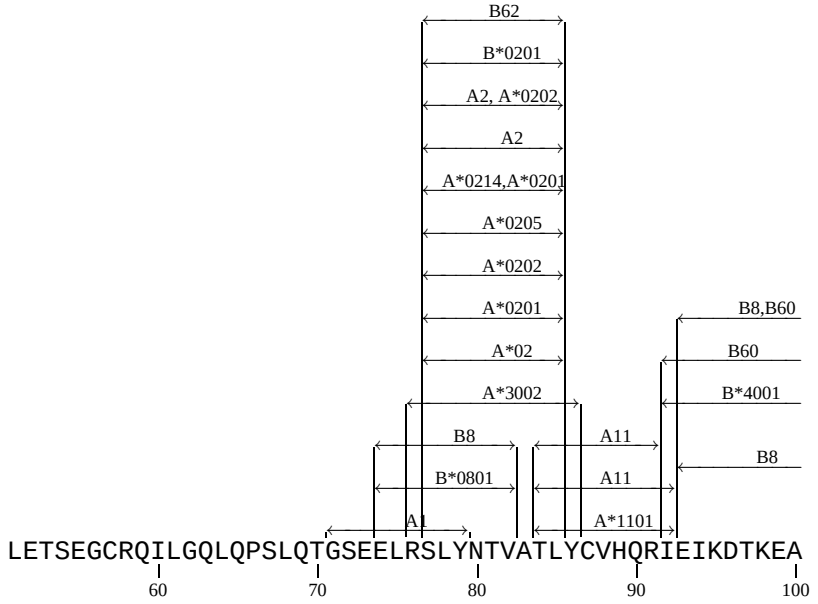
HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
p24(173–181)	p24(305–313)	RAEQASQEV	HIV-1 infection	human()	[Lubaki (1997)]
	• Eighty two HIV-1-speci£c CTL clones from 5 long-term non-progressors were isolated and analyzed for breadth of response • A sustained Gag, Env and Nef response was observed, and clones were restricted by multiple HLA epitopes, indicating a polyclonal response • Despite this being a well de£ned conserved epitope, and thought to be presented by B14, none of the 11 gag-speci£c clones from a B-14 positive subject could recognize either it or p24 PQDLNTMLN • Thought to be HLA-Cw8 restricted, not B14 as originally reported (C. Brander, B. Walker, and S. Rowland-Jones, personal communication)			
p24(173–181)	p24(305–313)	RAEQASQEV	HIV-1 infection	human(B14?)	[Price (1995)]
	• Study of cytokines released by HIV-1 speci£c activated CTL • Thought to be HLA-Cw8 restricted, not B14 as originally reported (C. Brander, B. Walker, and S. Rowland-Jones, personal communication)				
p24(173–181)	p24(305–313)	RAEQASQEV	HIV-1 infection	human(Cw8)	[Johnson (1991)]
	• Originally reported as HLA-B14 restricted, but subsequently found not to be presented by cells transfected with B14 • Thought to be HLA-Cw8 restricted (C. Brander and B. Walker)				
p24(173–181)	p24()	RAEQASQEV	HIV-1 exposure	human(Cw8)	[Rowland-Jones (1998)]
	• A CTL response was found in exposed but uninfected prostitutes from Nairobi using previously-de£ned B clade epitopes that tended to be conserved in A and D clades – such cross-reactivity could protect against both A and D and confer protection in Nairobi where both subtypes are circulating • The A subtype consensus is RAeQAtQEV • The D subtype consensus is RAEQsQdV • Thought to be HLA-Cw8 restricted, not B14 as originally reported (C. Brander, B. Walker, and S. Rowland-Jones, personal communication)				
p24(174–184)	p24(306–316 LAI)	AEQASQDVKNW		human(B*4402)	[Brander & Goulder(2001)]
	• C. Brander notes this is a B*4402 epitope				
p24(174–184)	p24(306–316 LAI)	AEQASQDVKNW		human(B*4402,B44)	[Brander & Walker(1997)]
	• Pers. Comm. from D. Lewinsohn to C. Brander and B. Walker, C Brander *et al*., this database, 1999				

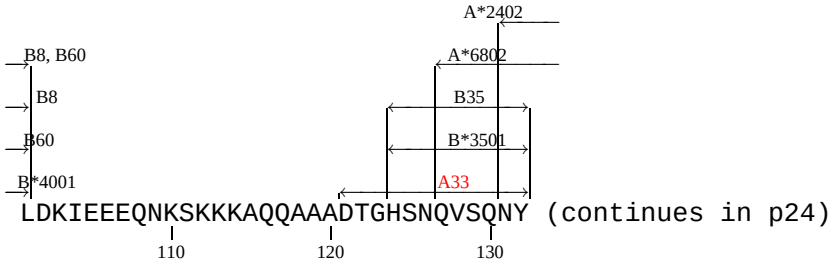
HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
p24(174–184)	Gag(306–316)	AEQASQEVKNW	HIV-1 infection	human(B44)	[Brodie (1999)]
	• The ability of CTL effector cells was studied by expanding autologous HIV-1 Gag-speci£c CTL *in vitro*, and adoptively transferring them • The transferred CTLs migrated to the lymph nodes and transiently reduced circulating productively infected CD4+ T cells, showing that CTL move to appropriate target sites and mediate anti-viral effects				
p24(174–184)	p24(306–316)	AEQASQEVKNW	HIV infection	human(B44)	[Brodie (2000)]
	• Study tracks and quanti£es *in vivo* migration of neo-marked CD8 HIV-speci£c CTL • Adoptively transferred gene-marked HIV-speci£c CTL homed to speci£c lymph node sites, colocalizing within the parafollicular regions of the lymph node adjacent to cells expressing HIV tat-fusion transcripts, indicative of viral replication • The CTL clones expressed CCR5 and localized among HIV-1 infected cells expressing MIP-1alpha and MIP-1beta, CC-chemokines produced at sites of viral replication, suggesting a possible homing mechanism • This study provides a methodology for tracking and studying antigen speci£c CTL *in vivo*				
p24(175–186)	p24(307–318)	EQASQEVKNWMT	HIV-1 infection	human(B44)	[Quayle (1998)]
	• HIV is found in semen both as cell-associated and cell-free forms, and HIV-speci£c CTL could be found in the semen of 5/5 men with CD4 greater than 500 – 3 of the men were analyzed in detail and had broad CTL to gag, env and pol • Two CTL lines from one donor recognized this epitope • Isolation of CTLs speci£c to HIV in both male and female urinal tracts provide evidence that virus-speci£c lymphocytes come from the urogenital mucosa, and the authors speculate that CTL in mucosal tissues may be correlated with lower viral load in semen and reduced transmission				
p24(176–184)	p24(308–316 LAI)	QASQEVKNW	HIV-1 infection	human(B*5301)	[Brander & Goulder(2001)]
	• C. Brander notes this is a B*5301 epitope				
p24(176–184)	p24(309–317 LAI)	QASQEVKNW	HIV-1 infection	human(B*5701)	[Goulder (1996)]
	• Recognition of this peptide by two long-term non-progressors • Peptide de£ned on the basis of B*5801 binding motif, yet not cross-restricted except at high concentrations • Described as B*5701 in C. Brander *et al*., this database, 1999				
p24(176–184)	p24(311–319 LAI)	QASQEVKNW	HIV-1 infection	human(B*5701)	[Brander & Goulder(2001)]
	• C. Brander notes this is a B*5701 epitope				

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
p24(176–184)	p24(308–316 LAI)	QASQEVKNW	HIV-1 infection	human(B53)	[Buseyne (1997)]
	• Minimal sequence determined through epitope mapping • This is a relatively conserved epitope • HLA-Cw*0401 was de£ned as the restricting element, but cells that carry Cw*0401 varied in their ability to present this epitope – this could be the result of diminished cell-surface expression of Cw*0401 in some cells • The HLA presenting molecule for this epitope was originally described as Cw*0401, but subsequent experiments with an HLA B53+ C4- cell line and with C1R cells transfected with HLA-B53 have shown that the HLA restricting element is HLA-B53 (Pers. Comm., Dr. Florence Buseyne, 2000)			
p24(176–184)	()	QASQEVKNW		(B53)	[Brander & Goulder(2001), Buseyne (1996), Buseyne (1997), Buseyne(1999)]
p24(176–184)	()	QASQEVKNW		(Cw4)	[Brander & Goulder(2001), Buseyne (1997), Buseyne(1999)]

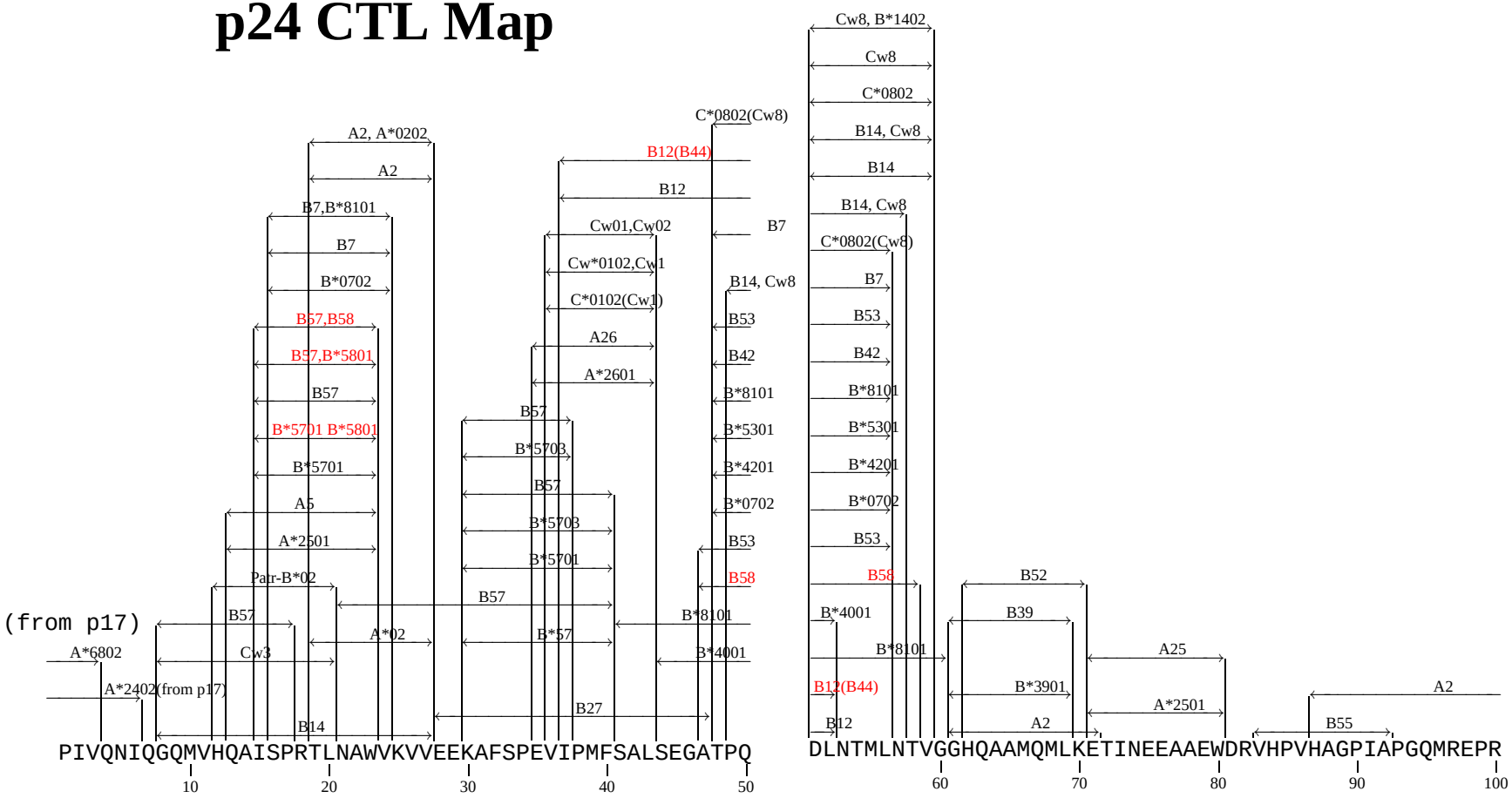
p17 CTL Map

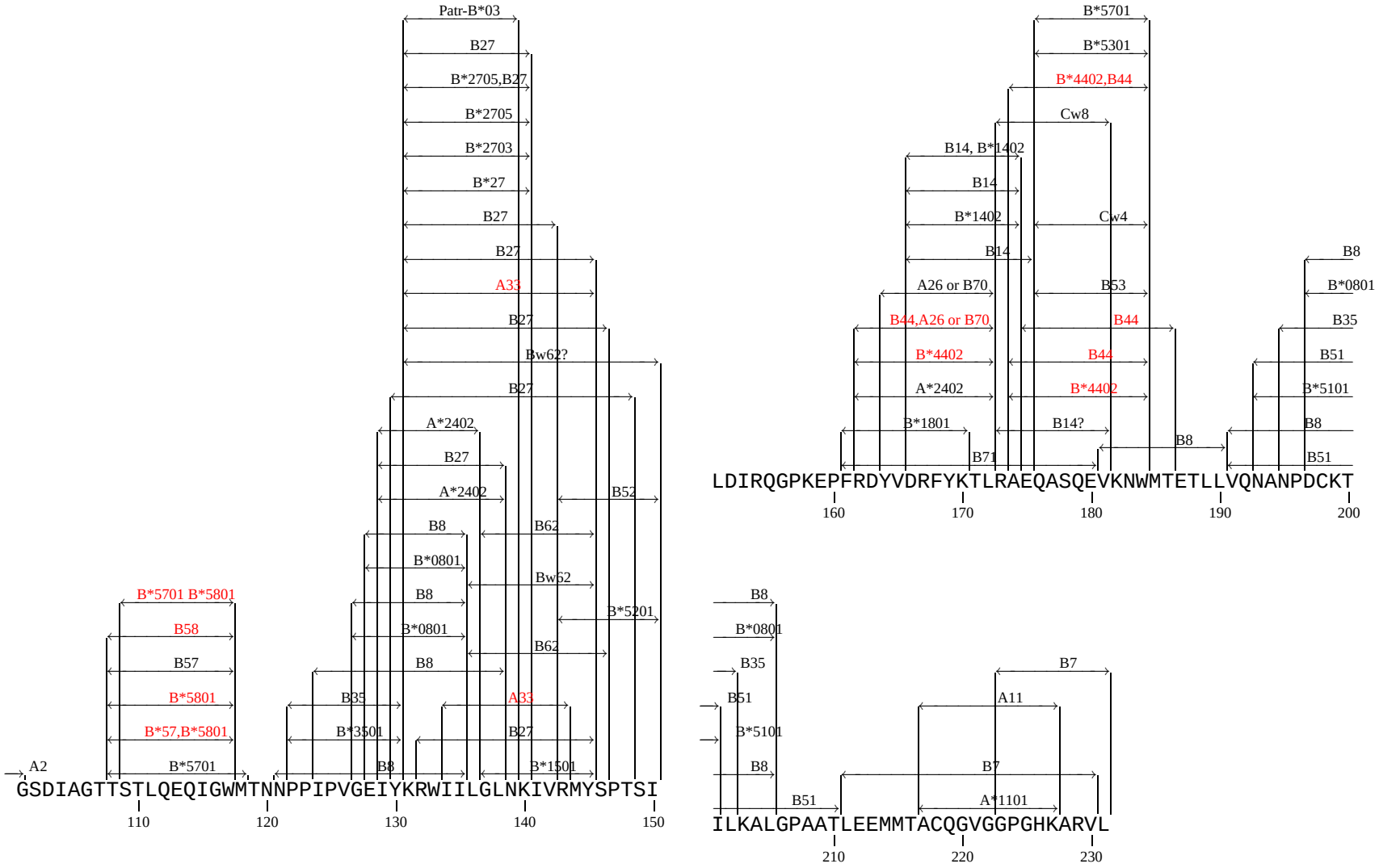

B8
B8
B*0801
B8
B7
not B8
B8
A3
Cw4
A3
A*0301
A*03
Bw62
B62
B42
A30,A3.1
A3.1
A3
A*0301
B27
B*0301
A3
A*0301
B27
B62
A3
A24
A23
A*2402
B35
B*3501
MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGL
10
20
30
40
50


B62
B*0201
A2, A*0202
A2
A*0214,A*0201
A*0205
A*0202
A*0201
A*02
A*3002
B8
B*0801
A1
A11
A11
A*1101
B8,B60
B60
B*4001
B8
LETSEGCRQILGQLQPSLQTGSEELRSLYNTVATLYCVHQRIEIKDTKEA
60
70
80
90
100

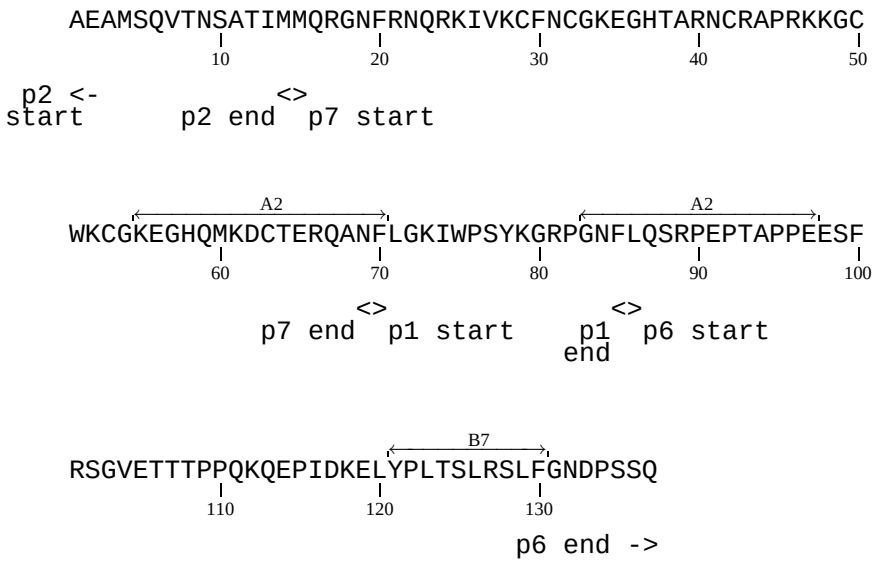

A*2402
A*6802
B35
B*3501
A33
B8, B60
B8
B60
B*4001
LDKIEEEQNKSKKKAQQAAADTGHSNQVSQNY (continues in p24)
110
120
130

p24 CTL Map

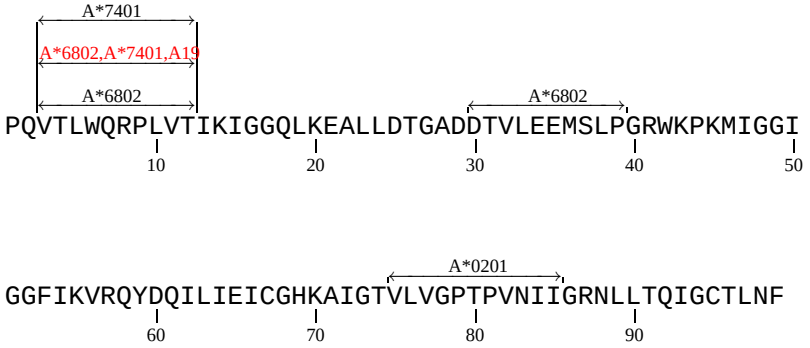

(from p17)
A*6802
A*2402(from p17)
A2, A*0202
A2
B7,B*8101
B7
B*0702
B57,B58
B57,B*5801
B57
B*5701 B*5801
B*5701
A5
A*2501
Pair-B*02
B57
B57
A*02
Cw3
B14
C*0802(Cw8)
B12(B44)
B12
Cw01,Cw02
Cw*0102,Cw1
C*0102(Cw1)
A26
A*2601
B57
B*5703
B57
B*5703
B*5701
B57
B*57
B27
B7
B14, Cw8
B53
B42
B*8101
B*5301
B*4201
B*0702
B53
B58
B*8101
B*4001
PIVQNIQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQ
10
20
30
40
50
Cw8, B*1402
Cw8
C*0802
B14, Cw8
B14
B14, Cw8
C*0802(Cw8)
B7
B53
B42
B*8101
B*5301
B*4201
B*0702
B53
B58
B*4001
B*8101
B12(B44)
B12
B52
B39
A25
B*3901
A*2501
A2
A2
B55
DLNTMLNTVGGHQAAMQMLKETINEEAAEWDRVHPVHAGPIAPGQMREPR
60
70
80
90
100


Patr-B*03
B27
B*2705,B27
B*2705
B*2703
B*27
B27
B27
A33
B27
Bw62?
B27
A*2402
B27
A*2402
B52
B8
B62
B*0801
Bw62
B*5701 B*5801
B8
B*5201
B58
B*0801
B62
B57
B8
B*5801
B35
A33
B*57,B*5801
B*3501
B27
A2
B*5701
B8
B*1501
GSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSI
110
120
130
140
150
B*5701
B*5301
B*4402,B44
Cw8
B14, B*1402
B14
B*1402
Cw4
B14
B8
A26 or B70
B53
B*0801
B44,A26 or B70
B44
B35
B*4402
B44
B51
A*2402
B*4402
B*5101
B*1801
B14?
B8
B8
B71
B51
LDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKT
160
170
180
190
200
B8
B*0801
B35
B51
B*5101
B8
B51
ILKALGPAATLEEMMTACQGVGGPGHKARVL
210
220
230
B7
A11
B7
A*1101

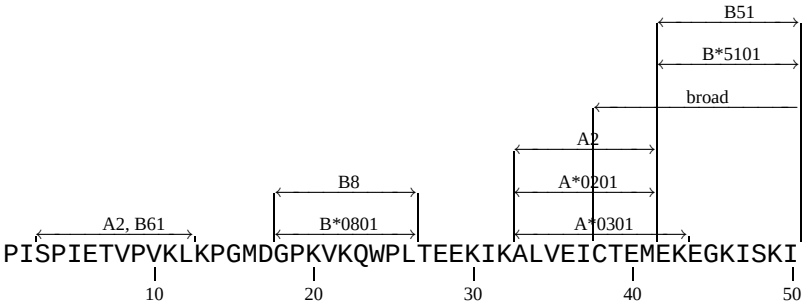
p2p7p1p6 CTL Map

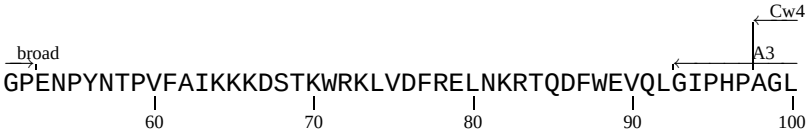


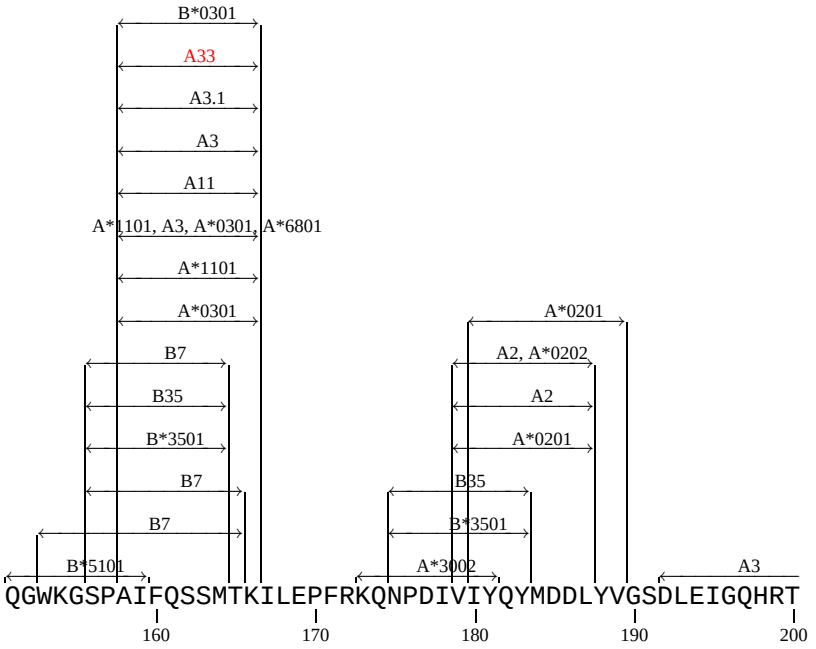
Protease CTL Map

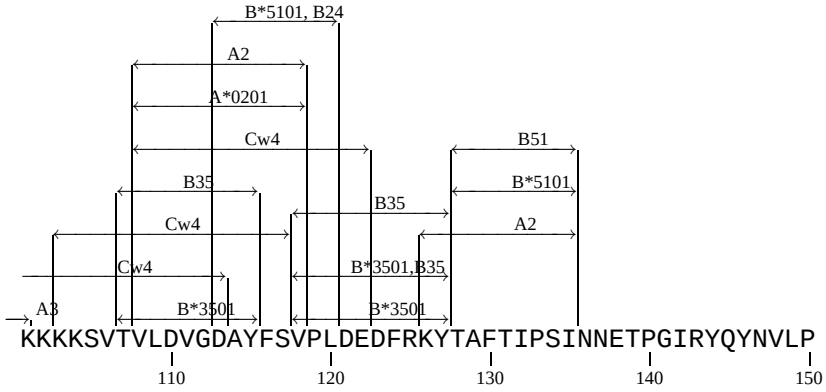


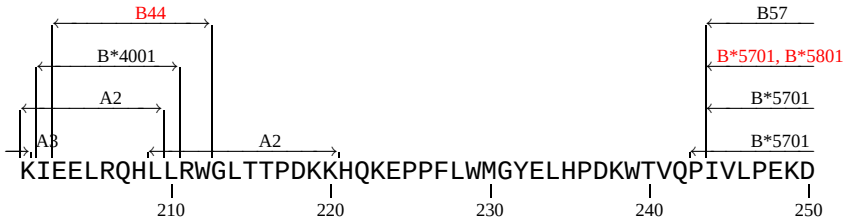
RT CTL Map

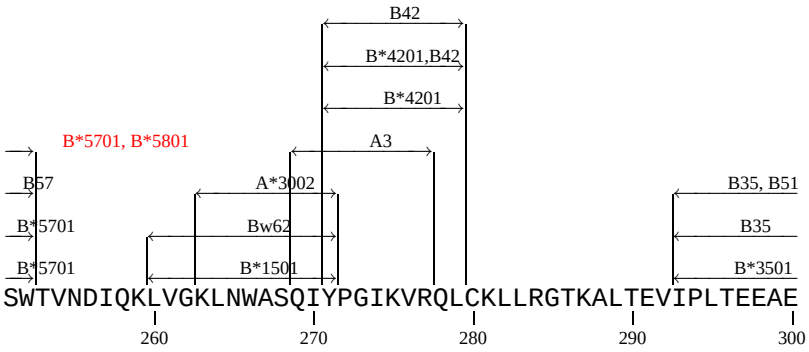

B51
B*5101
broad
A2
B8
A*0201
A2, B61
B*0801
A*0301
PISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKI
10
20
30
40
50

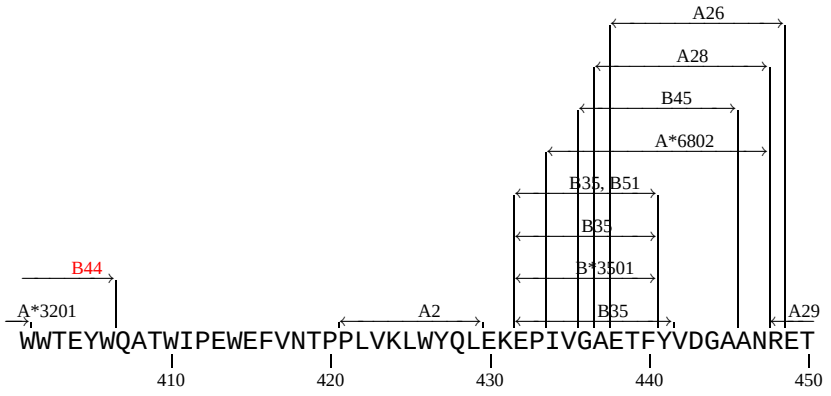

Cw4
broad
A3
GPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGL
60
70
80
90
100


B*0301
A33
A3.1
A3
A11
A*1101, A3, A*0301, A*6801
A*1101
A*0301
B7
B35
B*3501
B7
B7
B*5101
A*0201
A2, A*0202
A2
A*0201
B35
B*3501
A*3002
A3
QGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRT
160
170
180
190
200

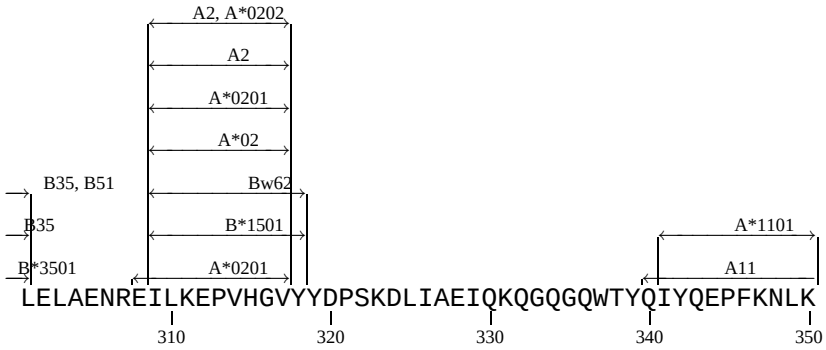

B*5101, B24
A2
A*0201
Cw4
B51
B35
B*5101
B35
Cw4
A2
Cw4
B*3501,B35
A3
B*3501
B*3501
KKKKSVTVLDVGDAYFSVPLDEDFRKYTAFTIPSINNETPGIRYQYNVLP
110
120
130
140
150

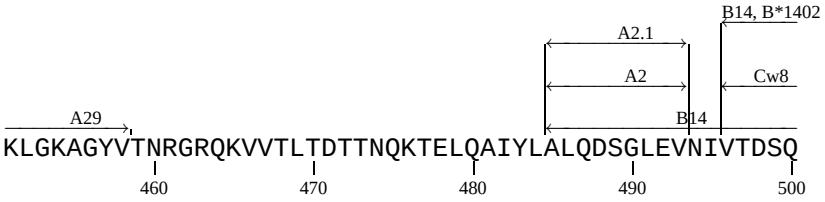

B44
B57
B*4001
B*5701, B*5801
A2
B*5701
A3
A2
B*5701
KIEELRQHLLRWGLTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKD
210
220
230
240
250

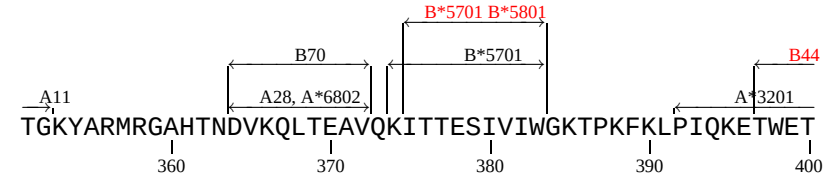


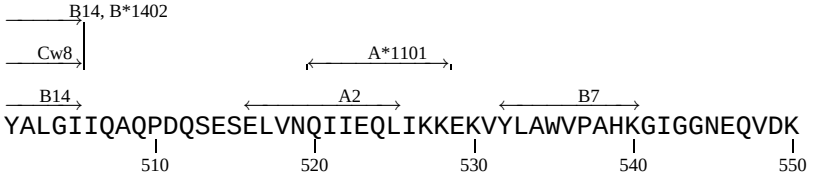


p15 RNase start <-





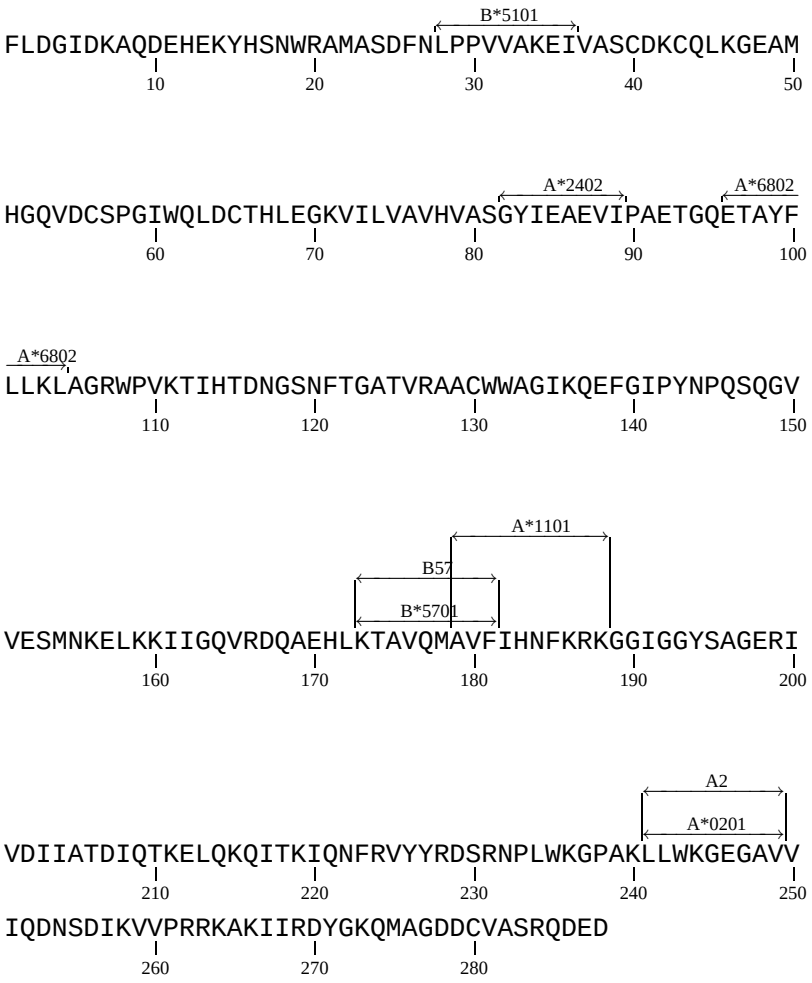




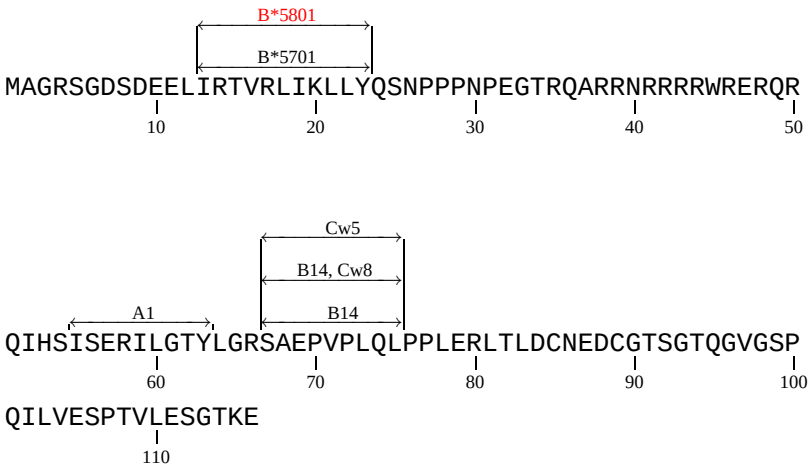
LVSAGIRKVL

-> p15 RNase end

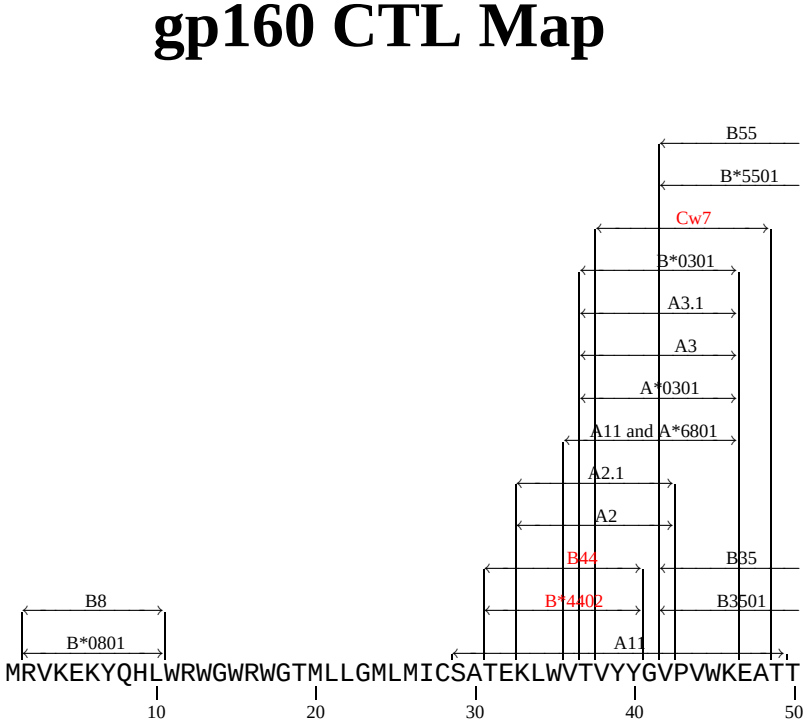
Integrase CTL Map



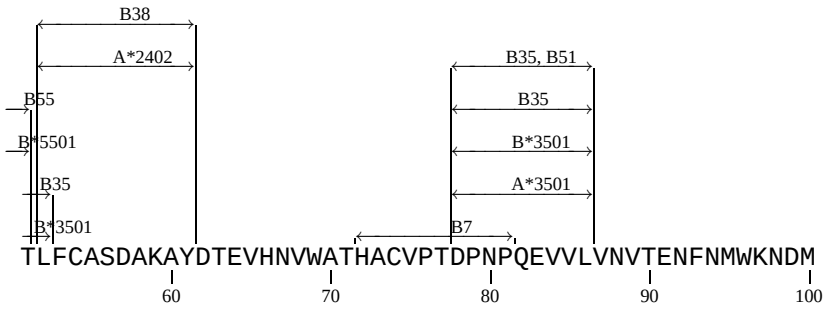
Rev CTL Map

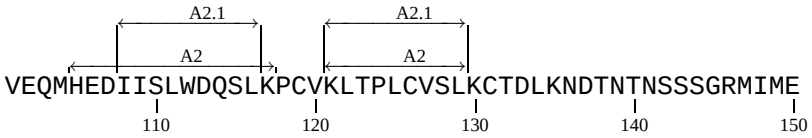


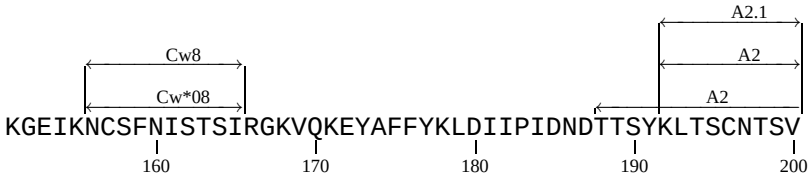
gp160 CTL Map

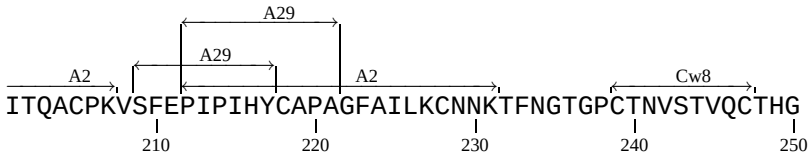


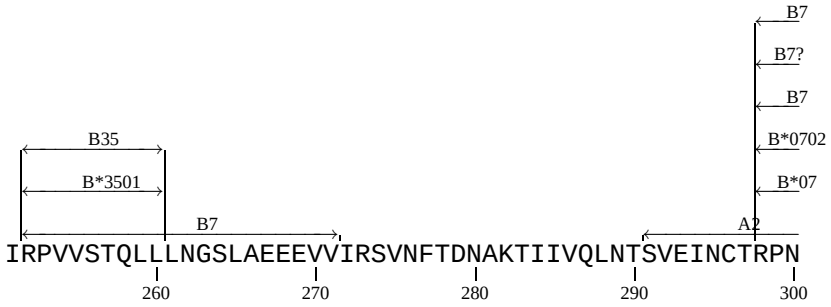
<- gp120 start

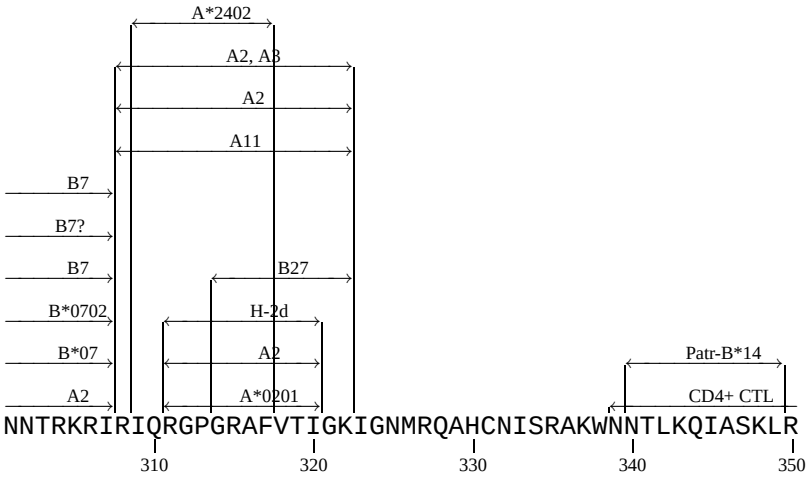


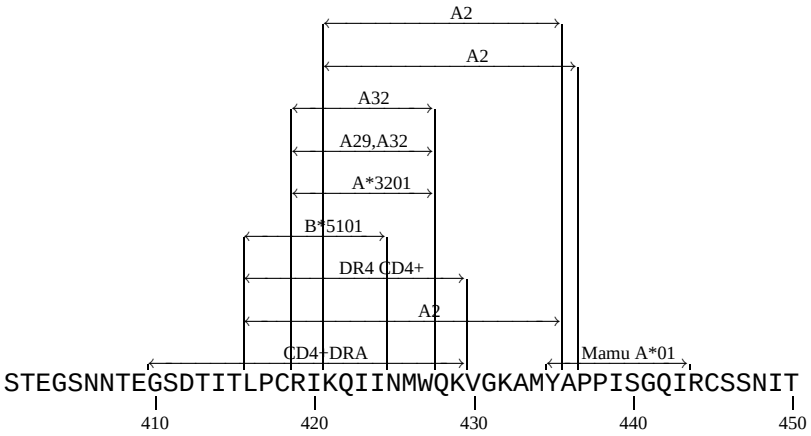


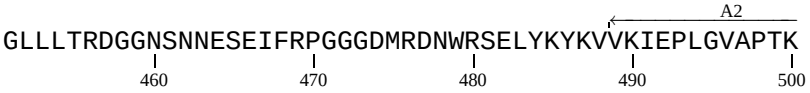




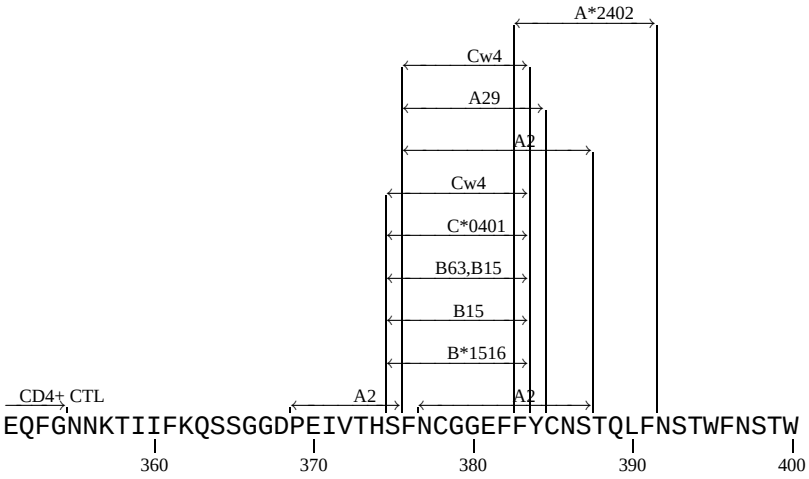


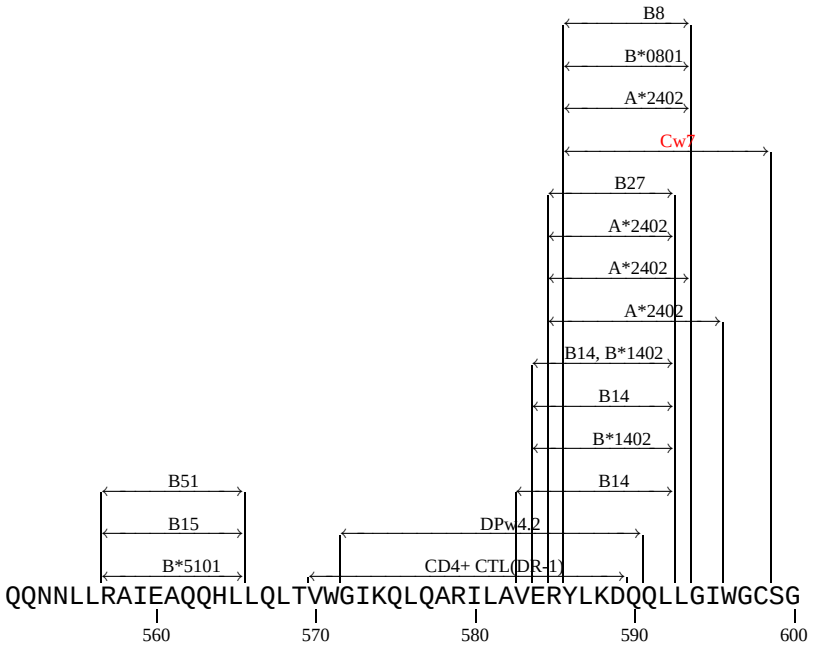


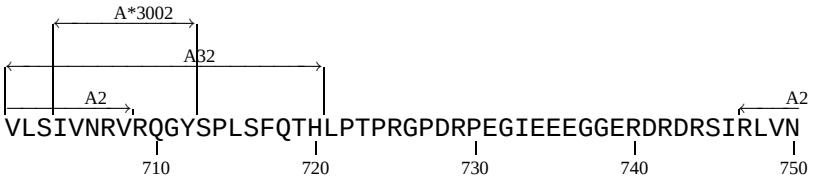


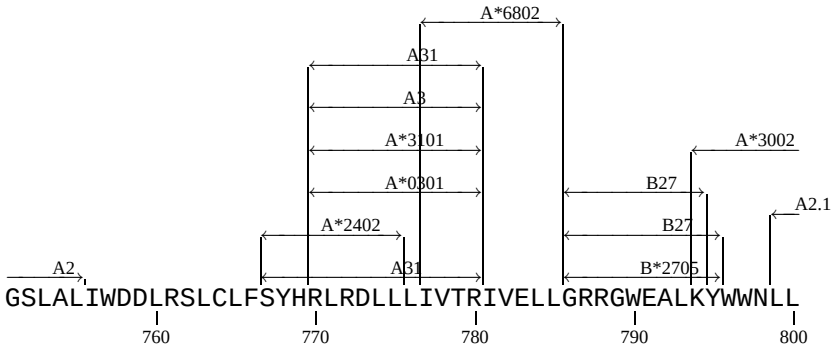


gp120 end <> gp41 start

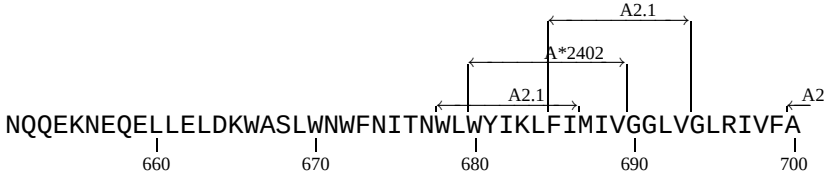


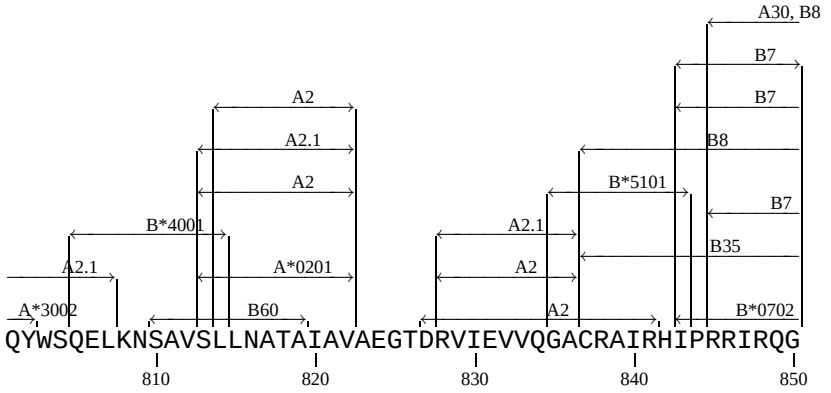

B8
B*0801
A*2402
Cw7
B27
A*2402
A*2402
A*2402
B14, B*1402
B14
B*1402
B14
B51
B15
B*5101
DPw4.2
CD4+ CTL(DR-1)
QQNNLLRAIEAQQHLLQLTVWGIKQLQARILAVERYLKDQQLLGIWGCSG
560
570
580
590
600

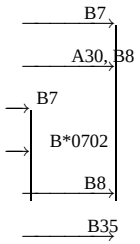

A*3002
A32
A2
A2
VLSIVNRVRQGYSPLSFQTHLPTPRGPDRPEGIEEEGGERDRDRSIRLVN
710
720
730
740
750


A*6802
A31
A3
A*3101
A*0301
A*2402
A31
A*3002
B27
B27
B*2705
A2.1
A2
GSLALIWDDLRSLCLFSYHRLRDLLLIVTRIVELLGRRGWEALKYWWNLL
760
770
780
790
800


B35
B*3501
KLICTTAVPWNASWSNKSLEQIWNHTTWMEWDREINNYTSLIHSLIEESQ
610
620
630
640
650


A2.1
A*2402
A2.1
A2
NQQEKNEQELLELDKWASLWNWFNITNWLWYIKLFIMIVGGLVGLRIVFA
660
670
680
690
700

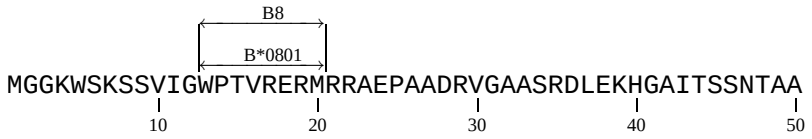

A30, B8
B7
B7
A2
A2.1
B8
A2
B*5101
B*4001
A2.1
B7
A2.1
B35
A*0201
A2
A*3002
B60
A2
B*0702
QYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQGACRAIRHIPRRIRQG
810
820
830
840
850

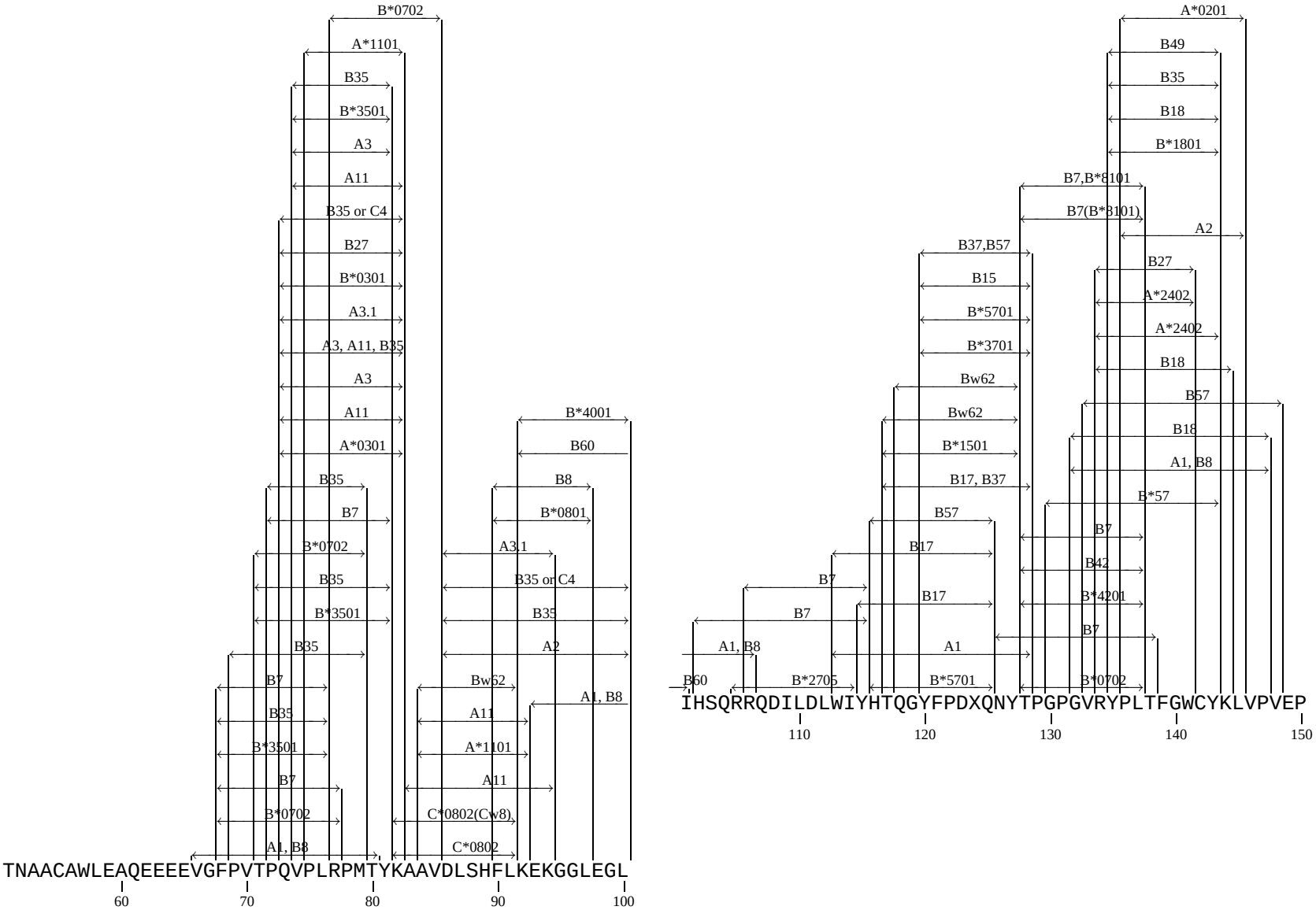


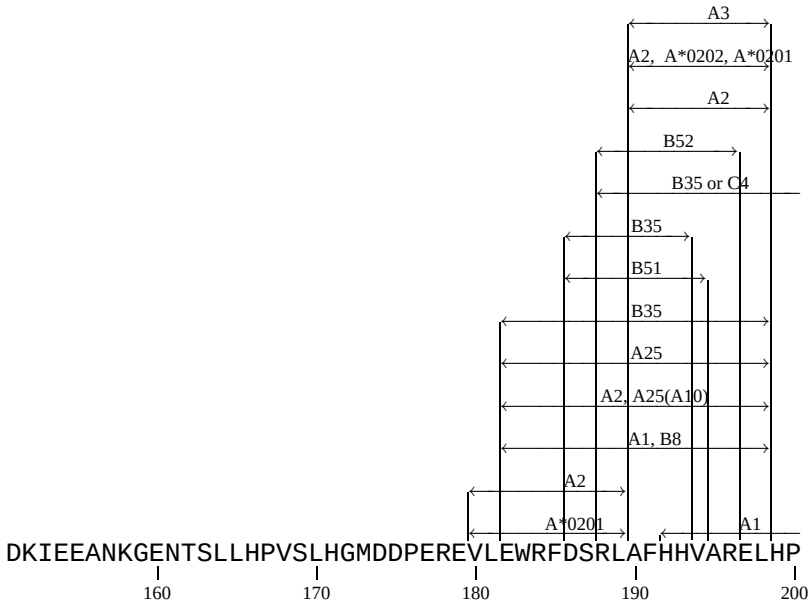
LERILL

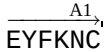
-> gp41 end

Nef CTL Map




B*0702
A*1101
B35
B*3501
A3
A11
B35 or C4
B27
B*0301
A3.1
A3, A11, B35
A3
A11
A*0301
B35
B7
B*0702
B35
B*3501
B35
B7
B*0702
A1, B8
B*4001
B60
B8
B*0801
A3.1
B35 or C4
B35
A2
Bw62
A1, B8
A11
A*1101
A11
C*0802(Cw8)
C*0802
TNAACAWLEAQEEEEVGFPVTPQVPLRPMTYKAAVDLSHFLKEKGGLEGL
60
70
80
90
100
A*0201
B49
B35
B18
B*1801
B7,B*8101
B7(B*8101)
A2
B37,B57
B27
B15
A*2402
B*5701
A*2402
B*3701
B18
Bw62
B57
Bw62
B18
B*1501
A1, B8
B17, B37
B*57
B57
B7
B17
B42
B7
B17
B*4201
B7
B7
A1, B8
A1
B60
B*2705
B*5701
B*0702
IHSQRRQDILDLWIYHTQGYFPDXQNYTPGPGVRYPLTFGWCYKLVPVEP
110
120
130
140
150





[Bertoletti(1998)] A. Bertoletti. 1998. Notes: Personal communication.

[Borrow (1997)] P. Borrow, H. Lewicki, X. Wei, M. S. Horwitz, N. Peffer, H. Meyers, J. A. Nelson, J. E. Gairin, B. H. Hahn, M. B. Oldstone, & G. M. Shaw. Anti-viral pressure exerted by HIV-1-speci£c cytotoxic T lymphocytes (CTLs) during primary infection demonstrated by rapid selection of CTL escape virus. *Nat Med* **3**:205–11, 1997. (Medline: 97170967) Notes: Genetic pathways of virus escape from CTL pressure resembled virus escape from antiretroviral therapy.

[Borrow & Shaw(1998)] P. Borrow & G. M. Shaw. Cytotoxic T-lymphocyte escape viral variants: how important are they in viral evasion of immune clearance in vivo? *Immunol Rev* **164**:37–51, 1998. (Medline: 99011854).

[Brander & Goulder(2001)] C. Brander & P. Goulder. The evolving £eld of HIV CTL epitope mapping: New approaches to the identi£cation of novel epitopes. *HIV Molecular Immunology Database* pages IV–1, 2001. Notes: This review article in the annual HIV Molecular Immunology Compendium presents the table of Optimal CTL Epitopes that has been curated by Brander and others for several years.

[Brander & Walker(1997)] C. Brander & B. Walker. Systematic identi£cation of optimal HIV-1 CTL epitopes. *HIV Molecular Immunology Database* pages IV–1 to IV–11, 1997.

[Brodie (1999)] S. J. Brodie, D. A. Lewinsohn, B. K. Patterson, D. Jiyamapa, J. Krieger, L. Corey, P. D. Greenberg, & S. R. Riddell. In vivo migration and function of transferred HIV-1-speci£c cytotoxic T cells [see comments]. *Nat Med* **5**:34–41, 1999. (Medline: 99098306).

[Brodie (2000)] S. J. Brodie, B. K. Patterson, D. A. Lewinsohn, K. Diem, D. Spach, P. D. Greenberg, S. R. Riddell, & L. Corey. HIV-speci£c cytotoxic T lymphocytes traf£c to lymph nodes and localize at sites of HIV replication and cell death. *J Clin Invest* **105**:1407–17, 2000. (Medline: 20273932).

[Buseyne(1999)] F. Buseyne. Personal communication. *unpublished* 1999.

[Buseyne (1996)] F. Buseyne, M. Fevrier, S. Garcia, M. L. Gougeon, & Y. Riviere. Dual function of a human immunode£ciency virus (HIV)-speci£c cytotoxic T-lymphocyte clone: Inhibition of HIV replication by noncytolytic mechanisms and lysis of HIV-infected CD4+ cells. *Virology* **225**:248–53, 1996. (Medline: 97076239).

[Buseyne (1997)] F. Buseyne, S. Stevanovic, H. Rammensee, & Y. Riviere. Characterization of an HIV-1 p24 gag epitope recognized by a CD8+ cytotoxic T cell clone. *Immunol Lett* **55(3)**:145–149, 1997. (Medline: 97305622).

[Dong (1998)] T. Dong . Personal Communication 1998. Notes: Personal Communication.

[Goulder (1997)] P. Goulder, D. Price, M. Nowak, S. Rowland-Jones, R. Phillips, & A. McMichael. Co-evolution of human immunode£ciency

virus and cytotoxic T-lymphocyte responses. *Immunol Rev* **159**:17–29, 1997. (Medline: 98078460).

[Goulder (1996)] P. J. R. Goulder, M. Bunce, P. Krausa, K. McIntyre, S. Crowley, B. Morgan, A. Edwards, P. Giangrande, R. E. Phillips, & A. J. McMichael. Novel, cross-restricted, conserved and immunodominant cytotoxic T lymphocyte epitopes in slow HIV Type 1 infection. *AIDS Res and Hum Retroviruses* **12**:1691–1698, 1996. (Medline: 97118362) Notes: HLA-B*57 is over-represented in slow progressors. HLA*5801 is a closely related molecule, and while the de£ned anchor residues of HLA*5801 can be used to predict epitopes in HIV-1 proteins, the CTL from HLA-B*57 positive individuals have limited cross-presentation capacity with HLA*5801 targets. In this paper £ve new HLA-B*57 epitopes were de£ned.

[Johnson (1991)] R. P. Johnson, A. Trocha, L. Yang, G. P. Mazzara, D. L. Panicali, T. M. Buchanan, & B. D. Walker. HIV-1 gag-speci£c cytotoxic T lymphocytes recognize multiple highly conserved epitopes. Fine speci£city of the gag-speci£c response de£ned by using unstimulated peripheral blood mononuclear cells and cloned effector cells. *J Immunol* **147**:1512–1521, 1991. (Medline: 91349569) Notes: This study presented a detailed study of gag-speci£c CTL from HIV-1 seropositive individuals. Seven p24 and two p17 epitopes were described, that were recognized by class I-restricted CD3+CD8+ CTL. p17 epitopes: KIRLRPGGKKKYKLKHIVWASRELE and QTGSEELRSLYNTVATLYCVHQRIE; p24 epitopes: NPPIPVGEIYKRWIILGLNKIV, VHQAISPRTLNAWVKVVEEKAF, NAWVKVVEEKAFSPEVIPMFSA, SALSEGATPQDLNTMLNTVGGH, GHQAAMQMLKETINEEAAEWDR, and RAEQASQEVK.

[Kaul (2000)] R. Kaul, F. A. Plummer, J. Kimani, T. Dong, P. Kiama, T. Rostron, E. Njagi, K. S. MacDonald, J. J. Bwayo, A. J. McMichael, & S. L. Rowland-Jones. HIV-1-speci£c mucosal CD8+ lymphocyte responses in the cervix of HIV-1- resistant prostitutes in Nairobi. *J Immunol* **164**:1602–11, 2000. (Medline: 20109119).

[Lubaki (1997)] N. M. Lubaki, S. C. Ray, B. Dhruva, T. C. Quinn, R. F. Siliciano, & R. C. Bollinger. Characterization of a polyclonal cytolytic T lymphocyte response to human immunode£ciency virus in persons without clinical progression. *J Infect Dis* **6**:1360–7, 1997. (Medline: 97323979) Notes: Five individuals were studied who survived HIV infection in good health for over 5 years. A broad polyclonal response was found to multiple proteins.

[Price (1995)] P. Price, R. P. Johnson, D. T. Scadden, C. Jassoy, T. Rosenthal, S. Kalams, & B. D. Walker. Cytotoxic CD8+ T lymphocytes reactive with human immunode£ciency virus-1 produce granulocyte/macrophage colony-stimulating factor and variable amounts of interleukins 2, 3, and 4 following stimulation with the cognate epitope. *Clinical Immunology and Immunopathology* **74**:100–106, 1995. (Medline: 95087232) Notes: Cytokine release from stimulated CTL clones derived from either the peripheral blood or CSF of 3 patients was studied. HLA restriction was determined for two of seven clones. GM-CSF and TNF-α and IFN-γ were produced by all clones; most clones produced low amounts of IL-2, IL-3, and IL-4.

[Quayle (1998)] A. J. Quayle, W. M. Coston, A. K. Trocha, S. A. Kalams, K. H. Mayer, & D. J. Anderson. Detection of HIV-1-speci£c CTLs in the semen of HIV-infected individuals. *J Immunol* **161**:4406–10, 1998. (Medline: 98451499).

[Rowland-Jones (1998)] S. Rowland-Jones, T. Dong, P. Krausa, J. Sutton, H. Newell, K. Ariyoshi, F. Gotch, S. Sabally, T. Corrah, J. Kimani, K. MacDonald, F. Plummer, J. Ndinya-Achola, H. Whittle, & A. McMichael. The role of cytotoxic T cells in HIV infection. *Dev Biol Stand* **92**:209–14, 1998. (Medline: 98214896) Notes: In this paper CTL response to previously de£ned conserved epitopes was found in exposed but uninfected prostitutes in Nairobi. Subtypes A and D are circulating in this regions, and the reactive epitopes tended to be conserved. Similarly previous studies in the Gambia showed that exposed but uninfected prostitutes tended to have B35 presented CTL epitopes conserved between HIV-1 and HIV-2. It was suggested that what was special about B35 is simply that it presents epitopes found both in HIV-1 and HIV-2.